Generalisations from a qualitative South African information systems case study

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Abstract

This paper explores making generalisations from qualitative research by examining a community-based information systems design case study, set in South Africa. Baskerville and Lee (1999) distinguish between four types of generalisations and this framework is used in this case study. A number of generalisations are made, namely: the reconceptualisation of participation; the process of conducting action research, and the development of a communication framework based on Habermas' Ideal Speech Situation. From this case study, the argument is made that generalisations, both theoretical and practical, from qualitative research can be made, and that much valuable contribution in the IS field is lost, because IS researchers fail to make these generalisations.

1. Introduction

Generalisations are often inappropriately and narrowly confined to one or two particular views of research. These views are usually referring to statistic-based studies and refer to the probable mathematical relationship between observed phenomena in a sample to phenomena in the population (Baskerville, 1996, p5). From this perspective many IS researchers claim lack of generalisability from their research based on the argument of having examined 'only' a single case study or 'only' one organisation (Baskerville and Lee, 1999, p3).

Given the socio-technical nature of IS design, such an interpretation of generalisations is not generally applicable. In such a field generalisations can be useful from a theoretical perspective, but since IS researchers are often also addressing a particular problem in a complex social setting, empirical generalisations are also needed. Furthermore, if the aim of solving the problem is the improvement of human conditions of living then theory and practice need to interconnected. It is impossible to solve the problem solely by critiquing theories and necessitates becoming involved in real life situations. Habermas argues for the need for a dialectical social theory with practical intent:

the epistemological belief of the critical perspective is that knowledge is grounded in social and historical practices. There can be no theory independent collection and interpretation of evidence to conclusively prove or disprove a theory (Habermas, 1973, p20).

The purpose of this paper is to argue that:
- generalisations can be made from single qualitative case studies;
- both theoretical and empirical generalisations are needed, and;
- deeper critical reflection and analysis of qualitative IS research should be encouraged.

The paper is accordingly structured in the following manner. In the next section a broader perspective of generalisations, than the positivist approach noted above, is given. Its application in the IS field is also addressed. To illustrate practically the argument made for generalisations from single case studies, the next section explores a South African case study and in the following section the discussion focuses on the generalisations that can be made from that study. In conclusion, we summarise these generalisations and urge other IS researchers to critically reflect on their research so as not to lose much valuable contribution to the field.

2. Generalisations and qualitative IS research

Various debates exist over the question of development of generalisations from qualitative research. These vary from 'If there is a 'true' generalisation, it is that there can be no generalisation' (Lincoln and Guba, 1985, p110), to Baskerville and Lees' call for qualitative researchers to acknowledge the generalities of their work (Baskerville and Lee, 1999). Much of this debate stems
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from the definition of generalisations used and is the epistemological approach of the researcher. Guba and Lincoln's describe generalisations as '.... assertions of enduring value that are context-free. Their value lies in their ability to modulate efforts at prediction and control.' (Lincoln and Guba, 1985, p111) This describes generalisations which are associated with a positivist approach to research and for the purpose of making predictions based on the case investigated. Guba and Lincoln proceed to replace the classic positivist generalisation with the term 'working hypothesis' (Lincoln and Guba, 1985, p123). In this case generalisations are tentative assertions of the situation which are uncovered and tentatively applicable to other situations. The transferability depends on the similarities between the contexts (what Guba and Lincoln term 'fittingness') and what Geertz would term 'thick descriptions' of the contexts to determine the similarities. This represents a move towards an interpretive research approach to generalisations, where generalisations are understood as providing insights or ideas for applications to other similar cases.

Lee and Baskerville's most recent work (Lee and Baskerville, 2003) provides a comprehensive review of generalisations in the IS field, though there are also other IS researchers advocating for the need to develop generalisations from qualitative empirical research (Walsham, 1995). After exploring the philosophical foundations of different forms of generalisations, namely the positivist and interpretivist schools, Baskerville and Lee develop a framework of four different types of generalisations. They distinguish between the base from which the generalisation is being made, either empirical or theoretical, and the base to which the generalisation is being made, again either empirical or theoretical. The four types of generalisations are thus empirical to empirical; empirical to theoretical; theoretical to empirical, and; theoretical to theoretical (Lee and Baskerville, 2003).

Based on this framework, in the case study described in this paper, there are two levels of generalisations that are relevant:

- moving from one empirical base to another by developing concepts, drawing specific implications and contributing to rich theory, and;
- moving from the empirical base of a case study to a theoretical base by revising, editing, highlighting or generating theory.

It is under these empirical categories that Walsham's four types of generalisations for interpretive case studies fall and are useful in describing the contributions from this case study. Walsham uses Bhaskar's concept of generative mechanisms to extend the notion of generalisations from interpretive case studies. Generalisations can best be viewed, according to Walsham, as 'tendencies' and thus, the generalisations used in Walsham's article are best '. seen as explanations of particular phenomena derived from empirical interpretive research in specific IS settings, which may be valuable in the future in other organisations and contexts.' (Walsham, 1995, p79). Walsham outlines four types of generalisation from interpretive case studies: the development of concepts, the drawing of specific implications, the contribution of rich insight and the generation of theory. The four types of generalisations are not mutually exclusive.

The first three of these four types of Walsham's generalisations are from empirical to empirical. Generalising from empirical to empirical statements involves the generalisability of data to a measurement, observation or other description within and beyond the domain from which the data were collected. The first type of generalisation is the development of concepts. Walsham gives the example of 'informate' from Zuboff's work, where the concept can be part of a broader network of concepts, propositions and world-views which form theories in the social science.
The second type involves specific implications in particular domains of action. One implication from the study of Walsham and Waema [referred to in (Walsham, 1995, p80), based on an in-depth case study of development of IS in a financial services company, concerns the relationship between the design and development process and business strategy. The implication is a good description of what Walsham terms a 'generative mechanism', which could be used in other organisations and contexts.

The third category of generalisations is that of 'rich insight' and is used to capture those contributions that cannot be easily described as concepts, theories or social implications. Giving the example of Suchmans' concepts of 'plans' and 'situated action', her various theories regarding human-machine interaction and specific implications, her contribution is described in this broader category of rich-insight (Walsham, 1995, p80).

Generalisation from empirical to theoretical statements involves the generalisability of measurements, observations, or other descriptions to theory, and the generalisability of the resulting theory beyond the domain that the researcher observes. To illustrate this last category of generalisations - the generation of theory - Walsham gives the example of Orlikowski and Robey work (Orlikowski and Robey, 1991) in IS to construct a theoretical framework concerned with the organisational consequences of information technology. Their framework was used by Jones and Nandhakumar (Jones and Nandhakumar, 1993) in a large manufacturing plant. They suggested further theoretical developments that would be needed to this framework.

3. Case study

After 1994, the South African government gave top priority to using the PHC approach in the delivery of health services. The PHC approach emphasises the need to serve the community and recognises the importance of community participation in the delivery of those services. The UThukela District Child Survival Project (TDCSP) was selected by the National Department of Health as one of three learning sites for the development of a community component to child health in 1999. The design a community-based child health IS was part of this child health project. TDCSP is a non-governmental organisation, which operated initially in the OKhahlamba municipality from 1995 to 1999 and expanded to the rest of the district from 1999 to 2003. Through a partnership with the community and Department of Health, TDCSP's mission, during the eight years of the programme, was to create a well-being context through child health, maternal health and HIV/AIDS interventions. These interventions were to be co-designed and implemented in a holistic, integrated and sustainable manner.

Research approach: interpretive, action research and longitudinal

Community-based IS development requires an understanding of people and the social and cultural contexts in which they live. As such, a qualitative approach which is designed to study social and cultural phenomena was used for this research (Myers, 2003, p242). Along with other interpretive researchers in the IS field (Walsham, 1993; Walsham, 1995; Lee, 1994 and Myers, 1994) the position that our knowledge of reality is a social construction by human actions was adopted. In order to understand the information needs of the community an attempt was made to understand phenomena by exploring the meanings people assign to them and the context in which that person acts.

An action research framework was adopted, as our aim was not just to study and describe an existing situation, but to change it through specific interventions. The action research approach was informed by Elden and Levin’s (Elden and Levin, 1991, p130) action research model and
incorporated the familiar five phase cyclical process, namely diagnosing, action planning, action taking, evaluating and specifying learning (Susman and Evered, 1978, p588). The cyclical approach to implementing, analysing and evaluating the changes in the IS, involved both the researchers and participants and is illustrated in Figure One.

The main milestones and events in the design of the community-based child health IS took place between 1999 and 2003 and are summarised in Table One. The process of specifically developing and designing the community-based child health IS commenced in 2002 and the implementation of the revised IS commenced in the first half of 2003.

### 3.2 Process and output of research

An important aspect of an action research approach is reaching an agreement between the insiders and the outsiders in terms of the objectives of the research, the roles and responsibilities, the resources needed and the principles of operation. One of the authors has been engaged with the Project since 1997. This support involved facilitation of meetings to develop a common understanding of the role of IS, training on data collection techniques and instrument design, conducting field work, facilitating group data analysis sessions, writing reports and facilitating feedback sessions and training on the use of new tools. A formal agreement was drawn up between the project and the author.
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<table>
<thead>
<tr>
<th>Year</th>
<th>Milestone</th>
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<tbody>
<tr>
<td>1995</td>
<td>First interventions of Child Survival Project commence in Okhahlamba municipality. Health IS was one of the interventions.</td>
</tr>
<tr>
<td>1999</td>
<td>Expansion of projects activities to the rest of the district. Site chosen for piloting of community child health project. Participatory Situational Analysis and Assessment was conducted.</td>
</tr>
<tr>
<td>2000</td>
<td>Monitoring and evaluation workshop conducted.</td>
</tr>
<tr>
<td>2001</td>
<td>Mid term evaluation includes evaluation of the health IS.</td>
</tr>
<tr>
<td>2002</td>
<td>Field work on a child health community-based IS commences.</td>
</tr>
<tr>
<td>2003</td>
<td>Community-based IS implemented in June. End of project evaluation included evaluation of the health IS. Child Survival Project ends activities and support in UThukela district</td>
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Table One: Major milestones of TDCSP child health intervention

From the participatory situational analysis conducted in the initial stages of the community child health intervention of TDCSP information on the situation of children in the municipality was gathered (Gbson et.al., 1999). Gaps in the information were identified and further research was conducted to fill those gaps (Gibson et.al., 2000). From this research the main people responsible for child health, the duty bearers, and other key people in the community (role players), were identified. These included: community health workers, clinic health committees, traditional leaders, councillors, social workers, early childhood practitioners, mothers (including teenagers), fathers, grandmothers and Project staff.

After agreement on the roles and responsibilities of the various parties was reached, the next aspect was to plan the research process. The first step taken in diagnosing was the development of a common vision around the role of IS in supporting attainment of the community's vision for child health. A co-determined vision for child health was achieved through community and district meetings and participatory exercises with different groups of people within the community. A participatory situation assessment was conducted to understand what IS were in place and how they were designed, along with an assessment of the health care and health seeking practices around children and the current health situation of children. Resources available (human, financial and institutional) were also mapped. Issues around participation, communication and capacity formed major themes in the assessment.

Once agreement was reached on the objectives and a greater understanding of the context was developed, plans for conducting the research were made. To understand what the information needs were, who should be involved in the development of IS and the format in which the information should be communicated, a total of 10 interviews, 15 focus group discussions and 1 meeting took place between July and September 2002 (one additional FGD with children was conducted in May 2004). Listening to different viewpoints of community members facilitated a greater understanding around the meaning of 'well-being' and 'at-risk' for a child, what actors/practices contribute to these situations, how the situations can be measured and, based on what action needs to be taken, who the information should go to and in what format.

The existing district health IS was reviewed so that the various role players would understand the existing system and then be able to review it in terms of their needs (BDCSP, 1999; TDCSP, 2001). The findings of these evaluations were fed back to the role players through written reports, poster sessions, drama and community presentations. As many of the role players were involved in the
projects evaluations they were also trained in data collection and analysis techniques, such as focus
group discussions and participatory learning for action methods. Thus capacity to review and
monitor future changes or activities was developed.

Additional surveys and reports from the project (BDCSP, 1996a; BDCSP, 1996b; BDCSP, 1999b;
TDCSP, 2000) provided a broader understanding of the area, as well as giving accounts of the local
knowledge and practices with respect to child health. Through group and individual level analysis
of the field work indicators, appropriate data collection tools and different information flows, were
incorporated into the district health IS. The aim of the exercise was to implement a system based
on community needs and in line with traditional and cultural practices of the community.

Through the collection of various views on what should be included in the community-based IS, an
IS was designed that fitted in with traditional views and values regarding the determination of
health. In line with these views of holistic health, new indicators were included into the
community-based IS. Specifically these indicators include measures for the context in which a
child lives, as well as including indicators that extend beyond the physical health of the child.
Discussions were held subsequently between different members of the community and district staff,
so that a common understanding on what the indicators meant could be reached. In order for the
new data items to be collected there was the need to revise the data collection forms. However, the
community health worker observation tool is not simply a revision of the old data collection forms,
but is used to facilitate discussion with the household.

One of the outcomes of the review of the existing health IS was that there was useful information
being generated by that system, but the key role players and duty bearers were not receiving this
information. Many of the role players felt that if they had access to the right information they
would be able to act based on that information. Emphasis was placed on appropriate feedback of
appropriate data for different levels. This was particularly important given that different role
players had become key to the health system since the original district health IS had been designed,
e.g. introduction of community health workers in the district and the increased involvement of local
government, especially the community-based structures. There are a number of platforms on which
the various role players can debate the information received and reflect on possible actions or
decisions. The design of these forums has been at different levels: household, community and
district. Attempts were made to make them as accessible as possible.

Throughout the process reports have been written and circulated amongst the researchers, Project
staff, provincial IMCI coordinators and national and district Department of Health. A number of
presentations also were given at national and provincial level. This involved the relevant level of
Department of Health (Maternal and Child Health), IMCI coordinators, University of the Western
Cape and UNICEF. Presentations at academic conferences have also been made and papers written
based on this case study.

The evaluation of the project, which included an evaluation of all the interventions, was conducted
in November 2003. Identifiable benefits to date are largely process-oriented: in other words,
improving the processes by which the health IS operates rather than the impact the IS had on child
health. More broadly, the community-based IS has helped to emphasise the importance of
information at community level within a district health IS, making it clearer where information
should flow based on who can take action, and highlighting the importance of feedback of
information to the community-level partners in child health.

In summary, four main changes to the district health IS were made:
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- determination of community's own indicators;
- changes in data collection forms;
- creation of forums for analysis and reflection, and;
- changes in the information flows for improved feedback.

4. Discussion

In this section three examples of generalisations, from the above case study, are explored. These include:

- Drawing of specific implications - reconceptualisation of participation;
- Contribution of rich insight - process of conducting action research, and;
- Generation of theory - communication framework.

4.1 Reconceptualisation of participation

Participatory design has been a topic of keen debate in the IS literature and participation has been used as a strategy in which to address power. However, much of the research and debates have been confined to the Western contexts, with only limited and peripheral contact with the developing country settings. Although some evidence of the attempts to extend IS research to 'developing country' domains has recently become discernible in the mainstream IS literature (for example, Sahay and Avergrou, 2002; Walsham, 2003), the issue of participatory design in these settings has lacked specific attention. Furthermore there are very few examples of the participatory designing of IS outside of the work context even in Western contexts. When related to community development programs the argument for participation is based on a more intuitive and ethical basis rather than on empirical grounds.

Participation needs to be more clearly defined in IS research and as participatory design is contextual, then practical examples of how and why participation took place are needed. The analysis of participation, in this case study, indicated the need to move away from the workplace to the community served by the PHC services; from participation of workers for improved design to participation as a right; from a vertical health system to a more multi layered and multi sectoral approach, and; from skill enhancement in system design to capacity development which facilitates participation and that addresses the challenges faced within systems and structures of health and related sectors.

An analysis of three case studies implementing health IS in developing countries, including the case study presented in this research, reveals the politics of design, the nature of participation, and the methods, tools and techniques for carrying out design projects are shaped with respect to the diversity of the socio-economic, cultural and political situations faced in each of these settings. Though common strategies, such as capacity development, could be found that cut across the three case studies it is the importance of the contextual nature of participatory design that emerges most strongly. There is no single algorithmic best practice regarding participatory design in IS which is applicable to all situations (Puri et. al., 2004).

What is important in participation in IS is who decides what data to collect, who collects it, who interprets the information and uses the finding and how participation can make decision-making a more democratic process. Participation in IS design should be a social process of bringing people together to understand different views and share decision-making. IS researchers need to carefully define what they mean by participatory design (PD).
4.2 Process of conducting action research

This case study outlines the methodological approach that can be taken using a participatory action research approach in IS design. The small incremental steps in an action research process have been outlined - developing a partnership, creating a vision, participatory diagnosing of the problem, action planning and implementation and participatory evaluation. Each of these small incremental steps, take place in a flexible manner and are enacted as a team or partnership. Essential in this process is the need to create networks at local levels, as well as more broadly. Furthermore the sharing of experiences occurred amongst all role players in the community, as well as sharing beyond the community to enhance those networks. The necessity of building networks is not emphasised enough in action research. As Braa, Monteiro and Sahay note (Braa et.al. 2004), network establishment or enhancement is especially important when considering sustainability and scalability of a project or intervention.

Participatory action research fits in with the approach that theory and practice must be interconnected if the situation of people is to improve. It is impossible to obtain this objective solely by critiquing ideology or theories and necessitates becoming involved in real life situations (Habermas, 1973). Two important outcomes of using an action research approach are, addressing a practical problem and developing generalisations (practical and theoretical) from the process of solving that problem. Since changes are to be made in small incremental steps a longitudinal approach is also necessary. Often this is in contradiction to financial pressures, either of a government departments need to spend their budget within the fiscal year or restrictions of time placed on the intervention by donors or fenders of the project.

4.3 Communication framework

Communication involves more than the understanding of language used. Within the literature on organisation as culture, there is the primary view that culture is shared meaning. Within an organisation this has led to studies interpreting, reading or deciphering patterns of symbolic discourse (Walsham, 1999). Culture is an active living phenomenon. The enactment of meaning within an organisation is, at least partly, a collective activity which creates structures of shared meaning within an organisation. These structures, as illustrated through Giddens structuration theory change and are recreated over time through action. Walsham notes, though addressing computer-based IS specifically, that IS have a key role in the process of enactment and reality construction, yet the cultural metaphor in its symbolic form has received relatively little attention in the IS literature. One exception being the article by Feldman and March (Feldman and March, 1981) where information was viewed as embedded in social norms that make it highly symbolic. Other work is that of Lyytinen (Lyytinen, 1985) where IS is viewed as language-based systems and their use involves communicative acts which can be studied as linguistic process. Few IS studies look at dialogue as an important part of the structuration process.

One useful concept, used in this case study, in exploring communication and shared meaning in IS design is Habermas's idealised public sphere (Habermas, 1989). The public sphere is used to describe the attempts to create spaces where people can openly discuss their opinions and desires. Though unattainable, Habermas explores the principles for the attainment of an 'ideal speech situation'.

Rather than using Habermas' account of the public sphere as one large forum where all participants are present the view was taken, in this case study, that there is the need to view the public sphere as comprising smaller groups or 'sub-spheres' (similar to what Fraser (Fraser, 1993, p123) calls 'subaltern counter publics'). In the 'Ideal Speech Situation' a consensus is not necessarily achieved,
as it is the strength of the rational argument that ultimately decides on the agreed outcome of the discussion. Therefore if the approach of viewing the 'public sphere' as just one large group, then the minority view will always be over-ruled.

The 'Ideal Speech Situation' is, as the name implies, ideal and Habermas does not claim that all communication boundaries can be surmounted in attaining this state. So clearly the 'Ideal Speech Situation' was not achieved in this case study, but the principles for attaining this situation provide a useful framework in which cognisance was taken of the criteria in developing forums for communication, as well as in the analysis of the process followed. Table Two summarises the criteria which were explored in creating these communication spaces. The criteria were also used in reflecting on the achievements and challenges still to be addressed. A similar framework could be used in other IS research.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>What was achieved</th>
<th>Potential distortions</th>
</tr>
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</table>
| **Access:** (close to universal) | • Local language used.  
• Close to home or work.  
• Known facilitator or mediator.  
• Participatory techniques employed.  
• Flexible approach. | • 'Time-poverty' of women.  
• Used existing structures with existing constraints. |
| **Autonomy:** (free of coercion, allowed to question, and can introduce any assertion) | • Not obligatory to participate. | • Social pressures and tradition.  
• Could say what they feel facilitator wants. |
| **Hierarchy** (ability to participate, and free to express attitudes, desires and needs) | • Good participation in smaller groups.  
• Use of participatory techniques. | • Poor participation in mixed groups.  
• Influence of social inequalities and hierarchical structures. |
| **Rule of law** (especially lower levels of government) | • Participation endorsed in legislation.  
• Traditional communal decision-making. | • History of non-participatory government.  
• Insufficient knowledge of, or capabilities to demand for, rights. |
| **Quality** (common commitment to the ways of logic, and the competence to speak) | • Long history of TDCSP.  
• Capacity of facilitators and community members developed. | • Less participation in larger groups. |

Table Two: Characteristics, achievements and potential distortions in striving for the ‘ideal speech situation’

Striving for the attainment of the 'Ideal Speech Situation' helped the research team and participants to:
• highlight and sensitise issues of power;
• build on existing structures and systems;
• develop capacity and the accessibility of participation, and;
• understand the important role of communication and sharing our meanings in IS design and development.
5. Conclusion

In one municipality in South Africa a community-based child-health information system was designed to support the care of vulnerable children. However the problem of vulnerable children is not specific to this municipality. One of the implications of the HIV/AIDS pandemic is the increasing number of more vulnerable and marginalised children, not just in South Africa, but globally. The health system is complex and the inclusion of community data about children into the district health information system also needs to be institutionalised in broader national and provincial networks, if we are to move from localised to broader effects.

We cannot replicate in total what has happened in one area to other areas as the situations and contexts faced in different districts and provinces vary considerably. A context specific approach is needed for the design of information systems, and community-based information systems in particular. This contextual approach is widely discussed in information systems in fields such as computer supported cooperative work (Lyytinen and Ngwenyama, 1992) and in arguments for situated action (Suchman, 1987; Berg and Goorman, 1999; Walsham, 1993). It is important to learn from this study and draw from the expertise used and the extremely resource intensive (time and human) process that took place in uThukela to see what aspects of the process can be translated to other settings. Despite the need for situated approaches, we argue that the need to consider generalisations strategies stems in this case from the similarities in the problem of vulnerability, standardising the complex health care structures, and issues of costs.

In this paper, based on the analysis of a case study, generalisations from a theoretical and practical perspective are formed. Table Two summarises the empirical generalisations which can be made from qualitative research and the particular contributions made from the case study under investigation.

<table>
<thead>
<tr>
<th>Broad area of generalisation</th>
<th>Specific generalisation</th>
<th>Contribution in case study</th>
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<tbody>
<tr>
<td>Empirical to empirical</td>
<td>Development of concepts</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>Drawing of specific implications</td>
<td>Reconceptualisation of participation</td>
</tr>
<tr>
<td></td>
<td>Contribution of rich insight</td>
<td>Process of conducting action research</td>
</tr>
<tr>
<td>Empirical to theoretical</td>
<td>Generation of theory</td>
<td>Communication framework</td>
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</table>

Table Three: Generalisations from the OKhahlamba municipality case study

In general much valuable contribution is lost in IS research because generalisations, whether empirical or theoretical, from qualitative case studies are not made. More IS researchers should be encouraged to critically reflect on their work in terms of generalisations which could be made. This would contribute to the argument made here, that generalisations can be made from qualitative research and are equally valid as generalisations from quantitative statistical approaches.

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